Claims

[1] A method of providing a contained charge of semi-solid metal alloy for use in a process for forming an article, the method including
introducing a charge of molten metal alloy into a container; and
allowing the molten metal alloy to reach a semi-solid state, the container including
an elongate body defining a side wall of the container, a mouth at a first end of the body and an opening at a second end of the body remote from the mouth; and
a closure member closing the opening, the closure member being configured to be displaceable along an interior volume of the body from the second end towards the first end to displace the charge of semi-solid metal alloy and the closure member being of a metal alloy the same as or similar to the charge of metal alloy and having a melting point which is not less than the temperature of the molten metal alloy introduced into the container.

[2] The method as claimed in claim 1, in which the closure member is dimensioned to be displaceable through the mouth of the container.

[3] A process for forming an article, the process including
providing a contained charge of semi-solid metal alloy in accordance with the method as claimed in claim 1 or claim 2; and
displacing the charge of semi-solid metal from the container and forming the charge into a desired shape.

[4] The process as claimed in claim 3, which is a rheo-casting process.

[5] The process as claimed in claim 3 or claim 4, in which displacing the charge of semi-solid metal from the container includes displacing the closure member out of the elongate body, through the mouth.

[6] A rheo-casting container for containing a charge of semi-solid metal alloy, the container including
an elongate body defining a side wall of the container, a mouth at a first end of the body, and an opening at a second end of the body remote from the mouth; and
a closure member to close the opening, the closure member being configured to be displaceable along an interior volume of the body from the second end towards the first end to displace a charge of semi-solid metal alloy contained in the container and the closure member being of a metal alloy the same as or similar to the semi-solid metal alloy for which the container is to be used and having a melting point which is not less than the temperature at which the metal alloy is to be introduced into the container.

[7] The rheo-casting container as claimed in claim 6, in which the side wall defines a circular cylindrical interior surface, with the closure member being disc-shaped.

[8] The rheo-casting container as claimed in claim 6 or claim 7, in which the closure

member is located or locatable with a friction fit inside the body to close the opening, whilst still being displaceable along the interior volume of the body.

[9] The rheo-casting container as claimed in any one of claims 6 to 8 inclusive, in which the closure member is dimensioned to be displaceable through the mouth of the container.

[10] A process for forming an article, the process including
locating a container containing a charge of semi-solid metal alloy in a passage in front of a plunger or piston arranged to travel relative to the passage to force the charge of semi-solid metal alloy into a desired shape; and
displacing the charge of semi-solid metal alloy from the container and forming it into the desired shape by causing relative travel between the plunger and the passage.

[11] The process as claimed in claim 10, in which the container is open-ended and includes a displaceable closure member closing one opening and configured to be displaceable along an interior volume of the container from the one open end closed by the closure member towards the other open end, displacing the charge of semi-solid metal alloy including pushing with the plunger against the closure member to displace the closure member and the charge of semi-solid metal alloy from the container.

[12] The process as claimed in claim 11, which includes leaving the closure member to form part of a solidified runner of an article formed by the process.

[13] The process as claimed in claim 12, which includes separating the runner from the cast article, treating the runner, including the closure member, optionally together with further metal alloy, to provide a further container containing a charge of semi-solid metal alloy, and locating the container in the passage in front of the plunger, in order to form a further article.

[14] An injection sleeve or shot sleeve for a die-casting machine, the sleeve defining a plunger passage and including a container supporting portion to support a container containing a charge of semi-solid metal alloy with the charge being axially aligned with the plunger passage.

[15] The injection sleeve as claimed in claim 14, in which the container supporting portion includes a cradle to support said container, the cradle being shaped to support a container too large to fit into the plunger passage.

[16] The injection sleeve as claimed in claim 14 or claim 15, in which the plunger passage has a circular cylindrical interior surface and the container supporting portion is configured to support a container having a circular cylindrical interior with an interior diameter the same or only marginally smaller than the interior diameter of the plunger passage, the container supporting portion making provision for the wall thickness of the container so that the plunger passage and the container are axially aligned.

Claims

1. An end-of-use protective element (3) for needles for perfusions, transfusions and suchlike which envisages the complete insertion and locking of a needle (6) fitted with wings (7) within a protective case, characterised by the fact that the said element is composed of a first portion (1) and a second portion (2) which are reciprocally constrained by means of a connecting element (4) at the time of production and shipping and which are separate at the time of use, said separation being rendered possible by the detachment of the said connecting element, and by the fact that the first portion (1) is fitted with a pan (12) and the second portion is fitted with at least two first ridges (20) and at least two second ridges (24), said pan and said first and second ridges being positioned in the respective portions in such a way that they are located on the internal sides of the protective element (3), in a reciprocally opposing position, when the said protective element is in use; the said first and second portions being constrained together, when in use, via locking means (22) and corresponding slits (18) in the rear part of the said protective element.
2. A protective element according to claim 1, characterised by the fact that the first portion (1), the second portion (2) and the connecting element (4) are created by a moulding process in a single operation.
3. A protective element according to claim 1, characterised by the fact that the pan (12) is centred with the longitudinal central axis of the first portion 1, said axis corresponding to the longitudinal axis of the entire protective device (3) in both its extended configuration and its use configuration; the said pan being designed to act as a container for the drops of residual blood that may leak from needle (6) after its use

and its retraction into the said protective element.

4. A protective element according to claims 1 and 3, characterised by the fact that a frontal protrusion (14) is positioned in front of the pan (12) facing the front part (13); said protrusion being designed to constitute both a shoulder for the point of the needle (6) and a further barrier against blood leaking from the protective element (3), in the area corresponding with its front part.
5. A protective element according to claim 1, characterised by the fact that the height of the first ridges (20) is equal to the distance, when the protective element (3) is in use, between the lower surface of the second portion (2) and the steps (16) on the first portion (1); said height being designed to permit, when the protective element (3) is in use, the co-operation of the said first ridges with the corresponding step (16), said co-operation being designed to prevent blood leaking from the protective element (3) in the area corresponding with the external edges (8) of the said protective element.
6. A protective element according to claims 1 and 5, characterised by the fact that the distance between the second ridges (24) corresponds with the distance between the steps (16).
7. A protective element according to claim 1, characterised by the fact that on a base surface (9), designed to remain inside the said protective element when the latter is in use, there is a groove created (15a, 15b, 15c) which extends, essentially, along the entire length of the first portion (1).
8. A protective element according to claim 1, characterised by the fact that the height of the second ridges (24) is equal to the distance that exists, when the protective element (3) is in use, between the lower surface of the second portion (2) and the base surface (9) of the said